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English Teachers' Perceptions and Opinions on the  
Use of Instructional Technologies in the Inclusive Classroom

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### **Abstract**

Research has shown that instructional technologies can be harnessed by educators as powerful tools to both create and enhance forms of differentiation in order to provide a more engaging and interactive inclusive classroom for students with and without disabilities. However, these technologies are often under-utilized for students with disabilities in the inclusive classroom and are instead used as simple substitutes for printed assignments. The objective of this study was to learn how English teachers at the secondary level use and understand instructional technologies and how they differentiate instruction in an inclusive classroom. An online survey was conducted to obtain data on English teachers' perception and use of instructional technology in their own inclusive classes. This research addresses issues found in current usage of instructional technologies and provides insight on how to optimize differentiation in the inclusive English classroom.

### **Introduction**

My research project was dedicated on the use of instructional technologies to improve differentiation in the inclusive classroom, specifically focusing on the English discipline in secondary schools. The Council for Exceptional Children (1997) emphasizes the requirement of the least restrictive environment for students with disabilities in a public-school setting meaning that, unless impossible, educators must make proper accommodations for each student in their classroom to create the most positive learning experience. Additionally, according to a survey done by the Pew Research Center (2018), 95% of teens report that they either own a smartphone or have access to one and 45% say they are almost always connected to the internet (p. 2). By combining the idea of the least restrictive learning environment with the near ubiquitous student connection to technology, educators can harness the use of instructional technologies to enhance

and create new forms of differentiation, especially for students with disabilities, to boost learning ability in a digital environment that sparks interest in learners (Kalonde & Mousa, 2016; Price-Dennis, Holmes, & Smith, 2015; Smith & Tyler, 2011). For example, this could include students “creating digital response charts to a Langston Hughes poem in preparation for a forum on diversity and equity in American society” or simply having them edit an educational podcast using GarageBand (Price-Dennis et al., 2015, p. 195). However, instructional technologies are often under-utilized and used as simple substitutes for assignments, like using a digital scan of a text for ease of distribution (Fazelian, 2011; Naraian & Surabian, 2014; Smith & Tyler, 2011). By researching these topics, I wanted to increase awareness of instructional technologies for English teachers in inclusive classrooms so that they may better serve their students’ needs for learning and differentiation.

In the context of my research, the term *instructional technology* is best defined by the Association for Educational Communication and Technology (1994), stating that it is used for “analyzing problems, designing, implementing, evaluation, and managing solutions to the problems of learning” (as cited in Fazelian, 2011, p. 2052). Essentially, teachers can use instructional technologies to enhance and benefit student learning where traditional teaching methods have failed. I have specifically focused on these instructional technologies being used alongside inclusive education which Kratochvílová (2015) defines as “a process of integrating all children/pupils/students of the given community into regular mainstream schools ... and contribute to their individualization in all areas of the quality of a pupil’s life ... to the maximum extent” (pp. 637-38). This definition of inclusive education goes beyond its normal use by including numerous diversities of students such as students with different languages, ethnicities, income levels, etc., but for the purposes of my research, I have exclusively addressed the use of

inclusion regarding students with disabilities. By integrating students with disabilities into a mainstream classroom, they are given greater learning opportunities while having certain modifications and accommodations based on their individual needs. These needs tie into the idea of differentiation which simply means “tailoring instruction to meet the various needs of students” (Spencer-Waterman, 2004, p. ix).

By combining instructional technology with differentiation in the inclusive classroom, teachers are more able to accommodate students’ learning needs (Kalonde & Mousa, 2016; Naraian & Surabian, 2014). After thoroughly reviewing prior scholarship on the subject, I have created a survey for English teachers to discover how they utilize these technologies for planning differentiation as well as find out their overall demeanor in using and understanding technology in their classroom.

### **Literature Review**

Incorporating technology into education has been a hot topic in scholarly literature for many years. However, the research of implementing instructional technologies into the inclusive classroom has only recently become more prominent as of the early 2000’s; even still, much of it is lacking more recent developments as technologies advance at a rapid pace. The themes discussed in this literature review fall into three categories: (a) Types of technologies used in the inclusive classroom, (b) challenges of using technology in the inclusive classroom, and (c) solutions through professional development and teacher training.

#### **Types of Technologies Used in the Inclusive Classroom**

The most relevant technologies used in inclusive classrooms are classified as assistive or adaptive technology (AT). The term *assistive technology*, according to Naraian and Surabian (2014), is simply defined as “technology-based supports for students with disabilities” (p.

331). These types of technologies include but are not limited to: speech-to-text software, text reading software, and other alternative and augmentative communication devices (Naraian & Surabian, 2014). These devices can provide students with disabilities an avenue of communication and education for themselves that may otherwise be unavailable due to their disability. For example, if a student has a vision impairment, having class texts available in an audio format and providing them with speech-to-text AT will go beyond physical access of materials and help break down the intellectual barrier so that they may have equal learning opportunities among their peers (Naraian & Surabian, 2014, p. 336). Naraian and Surabian (2014) note that the utilization of AT is underwhelming in public education and that even if students have physical access to these supports, the technologies will be inefficient if student intellectual and social access needs are not met in turn (p. 333). To correct this gap in learning and better utilize these supports, educators must connect not only the student to the technology but link the technology to the idea of curriculum and pedagogy, meaning that it is not enough to simply use assistive technology, but educators must make a meaningful link between it and content-specific representation. This connection will assist in the development of the students' understanding of class material by learning through multiple, purposeful outlets (Naraian & Surabian, 2014, p. 333).

Kalonde and Mousa (2016) also put a focus on AT and how it needs to not only be available to students, but that it must be used in conjunction with other factors of education such as technology diversity, student motivation, accessibility, and learning goals that will promote the cognitive learning of students in the inclusive classroom (pp. 237-239). They also cite Moursund and Bielefeldt (1999), however, in saying that educators will often lack the ability to

incorporate these technologies to support students with disabilities (as cited in Kalonde & Mousa, 2016, pp. 237-238).

Smith and Tyler (2011) make a case for using Web-based instructional technologies for teachers in the inclusive classroom, stating that designers can readily update them to ensure accuracy and relevancy of materials and content provided. Additionally, these revisions and updates do not have the lag time of in-print publications which can experience delays of a year or longer (p. 328). Though “Web-based technology” is a very broad spectrum that includes any resource retrieved from the internet, including websites and other downloadable resources, it is important that educators test and filter through programs that they wish to use in their classroom to ensure their reliability (Smith & Tyler, 2011, p. 328). Smith and Tyler (2011) do not go into detail for ensuring the reliability of a given web-based source but do mention that the educator should confirm that any sources used are current and up-to-date with scholarly literature (p. 328). It is important to note that not all web-based materials grant wide accessibility for individuals with disabilities, but through a combination of these and AT, students will be able to ensure their own physical, intellectual, and social access to these technologies.

Barbetta and Spears-Bunton (2007) speak directly on the instructional technologies used in inclusive secondary English classrooms literacy support technologies, noting seven that can be used as differentiation tools: digitized text, text-to-speech, word-prediction, cognitive organizational, speech recognition, electronic reference, and alternative writing (p. 87). Barbetta and Spears-Bunton (2007) state that writing is a complex process for students that requires effort to follow specific rules, mechanics, and organizational skills that becomes even more intense and effortful for students with disabilities (pp. 92-93).

Digitized text technology allows teachers and students to edit previously unalterable text by putting into a custom word processor which can change nearly anything visual about the text like its size and font style to make it easier to read or adding images or highlighting key words to help with the cognitive processing of the information (Barbetta & Spears-Bunton, 2007, pp. 86-87).

Text-to-speech technology does exactly that, it converts written text to an audio format which supports students who are reading below grade level and helps to support learning new vocabulary while reading and writing (Barbetta & Spears-Bunton, 2007, p.88).

Word-prediction technology helps students with physical disabilities by requiring fewer keystrokes, having a choice of words appear on the screen to help reduce fatigue during writing exercises (Barbetta & Spears-Bunton, 2007, p. 89).

Cognitive organizational technologies create visual diagrams and graphic organizers digitally to help students see patterns and relations within content which provide structure for the prewriting process (Barbetta & Spears-Bunton, 2007, p. 89).

Electronic reference technologies allow students to find facts, definitions, and other pieces of information from a digital source which can benefit students with cognitive disabilities and those with more limited vocabularies (Barbetta & Spears-Bunton, 2007, p. 90).

Speech recognition technologies can be used to either turn spoken words into text or as a tool to control computer functions by speaking commands; these tools can help students with physical disabilities keep a similar work pace to their peers during writing exercises (Barbetta & Spears-Bunton, 2007, p. 90).

Lastly, alternative writing technologies help students with disabilities through flexibility of writing, eliminating handwriting issues, an ease of proofreading, an emphasis on writing



content, a support of writing mechanics, and by helping create a final product and deemphasizing more complicated steps of the writing process (Barbetta & Spears-Bunton, 2007, p. 91).

Barbetta and Spears-Bunton (2007) note that by using these seven types of tools in the classroom, struggling students can ease some of the burdens of the writing process based on their specific needs, helping them through the different stages of prewriting, composing, and editing their product (p. 86).

### **Challenges of Using Technology in the Inclusive Classroom**

Most often, teachers base their choice of using instructional technologies around the barriers that they or their students encounter both in and out of the classroom (Kalonde & Mousa, 2016, p. 240). The most common challenges faced by educators are their physical access and the availability of technologies, the perception and actual knowledge of those technologies, the time required to learn and adapt those technologies to their classrooms, and the lack of support that teachers receive from administration and technical staff (Kalonde & Mousa, 2016, p. 240). According to Morehead and LaBeau (2005), these challenges stem from conditions such as an apathetic approach to technology from educators, a lack of technological leadership amongst educators, and the absence of proper professional development focused on technology (as cited in Kalonde & Mousa, 2016, p. 240). When a school does not cooperate with the needs of their teachers to integrate technology into their classrooms, especially inclusive classrooms, the students become the victims of an education system that cannot support their individual needs for a fair and equal education (Kalonde & Mousa, 2016, pp. 240-241). Kalonde and Mousa (2016) put a lot of the blame for these challenges on the severe lack of research on the implementation of instructional technologies to prove their benefits for inclusive classrooms (p. 241).

Smith and Tyler (2011) address several challenges in the use of instructional technologies. The main challenge revolves around Web-based materials and the issue of quality versus quantity (Smith & Tyler, 2011, p. 330). Smith and Tyler (2011) note that few online resources are up to date with accurate information as well as approved for educational use by review panels. This can cause both confusion and the transmission of misinformation, but almost more importantly for inclusive education, if the resources are not accessible to all students, with or without disabilities, then there becomes an issue of exclusion (p. 330). There is also an issue with the lack of accessibility from outside of the classroom if the technology is assigned as such; though this may not necessarily be an issue for disabled individuals, it can be an issue if a student lacks internet or general technology access outside of school (Smith & Tyler, 2011, p. 330). Smith and Tyler (2011) also note that there can be a problem with transitioning from face-to-face interaction to an online environment. It not only requires an intense amount of time, but also may require support from technical professionals if something goes wrong with the program. Technicians may be available to assist during a malfunction, which can lead to interrupted learning experiences (p. 340).

Sewell and Denton (2011) discuss some of the issues that they experienced with incorporating multimodal literacies into secondary English classrooms. The term multimodal literacy is defined by Heydon (2007) as the construction of knowledge through more dynamic platforms than printed text that use sounds, pictures, and other supports and incorporates a more social aspect to learning (as cited in Sewell & Denton, 2011, p. 61). One difficulty Sewell and Denton (2011) claim is the increased demands for raising student test scores to meet state standards which can become the focus of a curriculum as opposed to diverse lesson planning (p. 61). Secondly, they cite Mills (2010), stating that not all students are technologically

knowledgeable or proficient and that they require additional training and time to ensure that they keep up with the work pace of their peers (as cited in Sewell & Denton, 2011, p. 61). Lastly, Sewell and Denton (2011) refer to the lack of teacher preparedness and training in using technology in their classrooms, meaning that educators had to completely rework their teaching styles and lessons to be more multimodal in nature while also learning and teaching the use of these technologies to their students (p. 65).

McGrail (2006) found that there was a severe lack of teacher control over what technologies were implemented into English classrooms. McGrail (2006) conducted a survey on a laptop initiative program in which teachers had to use specific software in their lesson planning while not being able to use other types of technology due to budget restrictions (p. 1). In this survey, teachers claimed that they were threatened with losing certain classes, such as advanced placement courses, if they did not implement certain technologies and that teachers were never consulted about the planning or training to use them (McGrail, 2006, p. 12). Administration made these decisions on their own and removed any teacher agency making teachers feel as if there were no longer any alternatives to teaching their classes (McGrail, 2006, p. 13). Another issue proposed by the respondents was that there was a lack of time to teach technological literacy to their students because of the already immense pressure to cover content used on standardized tests which consumed most of their teaching time (McGrail, 2006, p. 14). Additionally, respondents were worried about student distraction and the ease of plagiarism through internet access, stating that due to their lack of technological literacy, students were not properly prepared to handle the high amount of technology access (McGrail, 2006, p.22). Teachers also argued that the instillation of using technology all or most of the time was not inherently pedagogical in nature and that it was often used as a poor substitute for standard

learning whereas more pedagogical approaches, such as cooperative learning, focused more on a type of educational reform that changed the way students learned to address issues in differentiation (McGrail, 2006, pp. 16-17).

### **Solutions Through Professional Development and Teacher Training**

The primary solution presented for solving the challenges of instructional technologies and increasing their presence in the inclusive classroom lies in including more education on these technologies for preservice teachers during their education and in the professional development of veteran teachers (Kalonde & Mousa, 2016; Naraian & Surabian, 2014; Smith & Tyler, 2011). Naraian and Surabian (2014) claim that the majority of the issues stem from teacher education programs that offer a single course instead of integrating technology into each course to support the diverse curricula of the program as a whole (p. 341). This issue creates another in that it limits educators' perceptions and beliefs of how technology should be utilized in relation with the intellectual and social aspects of their students, which hinders both teachers' abilities to use the technologies and their students' access to the technologies in inclusive education (Naraian & Surabian, 2014, p. 341).

Chopra (2009), Futernick (2007), and Kopetz and Nellie (2009) found that teachers and other educators do not feel properly educated or prepared to deal with a diverse group of students, both with and without disabilities, so integrating technology into an inclusive classroom does not inherently provide better learning results for their students (as cited in Smith & Tyler, 2011, p. 324). Lockett and Barwick (2011) add that for college educators to consistently remain up to date on the research and literature of instructional technologies, differentiation, and the like, then they would have to read dozens of scholarly articles a day (as cited in Smith & Tyler, 2011, p. 326). Smith and Tyler (2011) propose, however, that preservice teachers and veteran

teachers can benefit from using Web-based instructional materials to help standardize teacher education so that there is less variation and higher quality during teacher education and professional development (pp. 328-330).

Naraian and Surabian (2014) suggest that by educating preservice teachers on AT and its various applications, teachers would be able to make better decisions on who could benefit from its uses in their classroom while also having a clear understanding of why that technology is helpful to a particular student or group of students (Naraian & Surabian, 2014, p. 331). Cochran and Lytle (2001) explain that with deeper understanding, technology would not be applied in a hit-or-miss fashion, but that teachers could assess students' overarching physical, cognitive, and social needs (as cited in Naraian & Surabian, 2014, p. 331).

Kalonde and Mousa (2016) conducted a survey to inquire how teacher educators integrate technology into their own courses and why they choose to do so (pp. 241-242). The results of the survey were broken down into several major themes that included the content of the courses that the teachers taught, how easily the technology could be used, the availability of and access to the technology, its cost, and how much experience the respondents had with technology (Kalonde & Mousa, 2016, pp. 242-245). While the content of the course being taught and the ease of use of the technology weighed in heavily with over half of the respondents, only about a third of them cited availability and access as a deciding factor for using technology (Kalonde & Mousa, 2016, pp. 242-243). Kalonde and Mousa (2016) also found that teacher educators are not considering the idea of inclusion (accessibility) and instead focus on their own usage of the technology for their students' assignments (p. 243). Overall, this study showed that incorporating technology into teacher education courses benefitted preservice teachers by building proficiency with technology, diversifying delivery of material and content, and

providing them with new ways to teach in their own classrooms (Kalonde & Mousa, 2016, p. 245).

Kajder (2005) also conducted a survey of teachers to analyze their disposition and understanding of using educational technologies (p. 15). This study found that while the participants were preservice teachers, despite having various backgrounds, all identified that they had only one course, Introduction to Educational Technology or EDLF 345, during their education that pertained to the pedagogical understanding and use of teaching with technology. Participants found the course as an adequate introduction, providing valuable information and direction on types of technology that they had not previously thought of using in the classroom, with something as simple as a digital class blog, which gave them a space to learn and experiment with unfamiliar technology in a controlled, faculty guided environment (Kajder, 2005, p. 16). However, participants had several complaints about the course and what followed; there was a lack of modeling provided for using the technology in an actual classroom and there were no follow up courses, nor did any of their other courses try to integrate technology into their learning experience (Kajder, 2005, p.17). This lack of follow-up resulted in a noted decline in the taught technological skills in a majority of the participants after completing the course and the minority who kept or improved on these skills were those who had training and experience outside of the teaching program (Kajder, 2005, p. 17). When asked what the most important resource for improving preservice teacher training in the use of technology, the most noted was having an instructor who was knowledgeable, supportive, and cooperative (Kajder, 2005, p. 20). Participants stated that instructors are often lacking in the technical skills required to properly teach a course centered around technology and that the preservice teachers were generally more

knowledgeable of even the most basic technologies such as using Power Point or even opening e-mail attachments (Kajder, 2005, p. 20).

McGrail (2006) offers the solution of collaboration between administrators, teachers, and the community before instilling any mandatory technological initiatives into a school system (p. 25). By including teachers in the planning and implementation process of technological supports in their classrooms, they will retain their agency in teaching their classes as well as be able to address issues that they may encounter with training, implementation, and students' technology literacy (McGrail, 2006, pp. 24-26).

### **Conclusion**

Instructional technologies, including assistive technology, Web-based software, and others are currently being under-utilized in inclusion classrooms to the detriment of students with physical, cognitive, or other disabilities (Fazelian, 2011; Naraian & Surabian, 2014; Smith & Tyler, 2011). Much of the available research suggests that the main causes of this poor utilization stem from challenges faced by educators like physical access and availability of the technologies, their perception, understanding, and knowledge of those technologies, the sometimes steep time investment of learning these technologies, and the lack of support that teachers receive from administration and technical staff (Kalonde & Mousa, 2016; McGrail, 2006). However, the largest issue gathered among these articles is a severe need to reform preservice teacher education and professional development (Kalonde & Mousa, 2016; Kajder, 2005; McGrail, 2006; Naraian & Surabian, 2014; Smith & Tyler, 2011). The current state of teacher education and professional development lacks true integration of instructional technology which, in turn, causes a lack of that technology to be incorporated into the classrooms of newly

established as well as veteran teachers (Kalonde & Mousa, 2016; Naraian & Surabian, 2014; Smith & Tyler, 2011).

## **Methods**

### **Research Questions**

I created an online survey of secondary English teachers inquiring about their knowledge, experience, beliefs, and attitude towards the use of instructional technology in an inclusive classroom. The purpose of this research was to address the following question: In what ways do teachers use instructional technologies to enhance differentiation methods and student-teacher interactions in an inclusive secondary English classroom and how can those methods be improved? In addition, I looked to answer the question: What are the beliefs and attitudes that English teachers have towards the use of adaptive and other instructional technologies?

By answering these questions, I was able to identify areas of improvement needed in current techniques used by educators as well as the dispositions that teachers hold for using instructional technologies as a tool for differentiation in the inclusive secondary English classroom. By finding ways to improve the use and disposition of instructional technologies, the education community can receive the benefit of effective differentiation methods that can assist students, with or without disabilities, in the inclusive classroom to be more motivated and productive in their learning environment.

## **Methodology**

### **Participants and Setting**

Participants of this study had to meet three requirements. Firstly, they are an active English teacher at either the middle or high school level. Secondly, they teach in the United States at a public school. Lastly, they have at least one of their classes be considered an inclusion



class. Experience and knowledge of instructional technologies were not requirements for taking the survey to ensure a variety of results. To best ensure that only those who met my criteria took the survey, I included the participant requirements in the informed consent form as a part of their agreement to be included in the survey, which can be found in Appendix A.

Participants were recruited using the snowball sampling method which allowed me to target my specific audience and allowed them to forward the survey to other potential candidates and so on to gather as many responses as possible (Biernacki & Waldorf, 1981, p. 142).

Participants received individual emails from the researcher with a recruitment message about the survey, how they could forward the email, and a clickable link to the survey. Email addresses were obtained by the researcher through contacting known acquaintances and colleagues; these participants were also given permission to forward the email to other potential candidates for the survey. Additionally, participants were recruited through social media pages of professional educational agencies, such as the Stafford Education Association, willing to promote the survey using a recruitment message and clickable link to the survey. Both recruitment messages can be found in Appendix B.

The survey was created using Survey Monkey, an online platform that allows for data collection and analysis in a password protected environment. This platform allowed me to present my consent form prior to the survey and only participants who agreed to the form were allowed access while others were redirected to a disqualification page. The survey answers were gathered by each participant so that I could evaluate their responses both individually and as a collective and their responses were all kept anonymous to protect their identities. Additionally, participants did not have to answer every survey item and were able to skip them for any reason.

## **Procedures**

To provide data, participants followed the link in the recruitment message and were redirected to the online survey on their computer or smart device. After agreeing to the informed consent form, a brief set of instructions were displayed to ensure that participants were able to navigate the survey properly. Fink (2013) advises including these instructions before the survey due to its digital nature and the unfamiliarity that some participants may have with the platform (pp. 47-49). After reading the instructions, participants were directed to the survey questions where they answered the questions to the best of their abilities and submitted the data for collection.

Fink (2013) states that using a variety of questions, both open-ended and close-ended questions, provides the best results because it retrieves both qualitative and quantitative data (p. 29). Based on this logic, my survey consisted of three types of questions: multiple-choice, Likert scale, and open-ended free response. Additionally, the survey was segregated into four pages based on what type of information was being requested: General Information, Instructional Technology, Needs of Improvement, and Free Response. A complete list of survey questions can be found in Appendix B.

The first page, General Information, inquired about the participant's age, years in teaching experience, highest level of degree earned, whether they teach middle or high school, and how many inclusion classes they currently teach. I gathered this data to see if there were any correlations with their disposition, experience, or knowledge of instructional technologies.

On the following page, Instructional Technologies, participants were asked questions regarding their disposition, experience, and use of instructional technologies in their classrooms. Questions varied between multiple-choice and Likert scale depending on the content of the

question. These questions were asked so that I could see correlations among participants and compare the data against the scholarship in my literature review.

Needs for Improvement gathered quantitative data using a Likert scale ranging from “Not interested” to “Very interested” on what participants felt could improve their experience with using instructional technologies in the classroom. These data were collected to analyze whether teachers agreed with popular opinions of published scholarly work.

Lastly, the Free Response page asked for examples, opinions, and additional comments about using instructional technology. These questions provided the qualitative data for my research and allowed me to have illustrative examples to compare to the literature as well as provide evidence for correlations seen in the quantitative data.

Prior to the survey’s finalization, I conducted a pilot test with myself and other M. Ed. students I know to ensure the clarity of questions and reliability of the software (Fink, 2013, p. 74). The data provided during the pilot test were not used in the results of my research.

Upon approval from the Institutional Review Board, I published the survey to Survey Monkey, sent out recruitment emails, and posted recruitment messages on social media. I left the survey open for approximately three weeks and sent out reminder messages to complete it before the survey’s end.

To analyze the retrieved data, I used two methods: descriptive statistics and content analysis. Descriptive statistics was used for the multiple-choice and Likert scale questions on the survey. Survey Monkey automatically creates numerical and illustrated charts to summarize the quantitative data as percentage responses for each question which I used to discover majority and minority answers within the survey (Fink, 2013, p. 117). I was also able to compare results of different questions from all, as well as individual, participants to see what types of correlations

existed in their responses. Content analysis allowed me to analyze open-ended questions based on common usage of words, phrases, and themes compared to information from the literature review (Fink, 2013, p. 131). Additionally, I was able to compare the results of the content analysis to other quantitative data from the survey in order to further observe correlations among participants.

### **Findings**

When asked about their expertise and skills of using instructional technologies in the inclusive classroom, most participants responded more positively than the prior research suggested yet agreed with the prior research in terms of where improvements need to be made. Additionally, when asked about their disposition in using these technologies, participants were nearly unanimously positive about integrating them into their lesson planning and differentiation tactics. 90% of participants felt more or much more positive using instructional technologies compared to when they first started teaching and the remaining 10% have remained the same, but none noted feeling negatively. Therefore, the discussion of the findings for this study focuses on presenting what correlations exist between the knowledge and use of instructional technologies with the positive demeanor expressed in that use and what contradictions exist between these positive demeanors and majority needs of improvement for integrating these technologies.

### **Correlations of Technology Use and Positive Demeanor**

When participants were asked to rate their own skill in using technology in their classrooms, every response was rated at least “average” with 40% of responses being “above average” or “far above average.” 70% of participants stated that they use instructional technologies three times a week or more while 60% use instructional technology as a

differentiation tool for students with an IEP or 504 Plan for most lessons while the remaining participants use it about half the time.

This trend of skill and use of instructional technologies in the inclusive classroom correlates with the majority opinion on using instructional technologies with 90% of the participants feeling more positively about them now than when they originally began teaching. When asked how they felt about implementing instructional technologies as differentiation tools for students with disabilities, participants unanimously provided positive examples and reasons, complimenting their responses about their skill and use of these technologies. Participant 5 noted that instructional technologies “are effective because they are motivating to the students and allow [the teacher] to differentiate and scaffold [their] instruction to each student” and Participant 2 stated that “speech to text is great way to help kids with reading disabilities write their thoughts with less pressure.” These participants exemplify the overall positive correlations between the use and demeanor of English teachers implementing instructional technologies into their inclusive classrooms.

### **Contradictions of Positive Demeanor and Needs of Improvement**

The positive demeanors of the participants are contradicted by their level of interest in improving knowledge, understanding, and collaboration regarding the use of instructional technologies in inclusive English classrooms. About 78% of respondents indicated that they needed more time to learn the intricacies of specific instructional technologies before integrating them into differentiation planning and nearly 90% stated that they needed more time for planning to use the technologies that they were already familiar with as a differentiation tool. In relation to this, Participant 8 notes that “sometimes teachers just need time to figure out how a technological tool will work best for their class environment.” Additionally, all respondents felt

the need for more collaboration with their colleagues on how to properly integrate technology into their classroom but when asked what they felt was most important to be able to successfully use instructional technology in their curriculum, there was no mention of collaborating with colleagues from any participant.

Conversely, only about 56% of participants felt the need for more professional training in regard to using technology which conflicts with the idea of needing more time to learn the technologies, but several respondents included the need for proper training when asked what was most important to successfully integrate technology into their classrooms. Similarly, about 56% of participants expressed interest in receiving additional support from the administrative staff in their schools when it comes to using instructional technology. This disconnect from administrative staff contradicts the majority opinion of wanting more time to collaborate with colleagues on the use of technology in the classroom.

### **Conclusions**

This study has provided areas of agreement as well as contradiction to prior research in terms of how English teachers feel about using instructional technologies in their inclusive classrooms and what they need to be able to improve their knowledge and understanding of instructional technology. I certainly have some concerns about what I have observed through this study and some of the respondents provided some surprising data. Additionally, future research in this subject area can be improved through a more focused approach on how to teach educators on understanding technology rather than how to use specific types of technology.

### **Connections to Prior Research**

The data collected through this study both supports and disagrees with much of the prior scholarship that was studied. Respondents agreed with the ideas of Kalonde and Mousa (2016),

Naraian and Surabian (2014), and Smith and Tyler (2011) for the need of extra training to become more adept in using instructional technologies with about 80% of participants showing interest in more professional training with technology. However, the overall positive disposition of participants went against the ideas of Kajder (2005) and McGrail (2006) whose surveys both stressed the discomfort and negative outlook on teacher confidence in using instructional technologies with 90% of participants stating that their disposition with technology in the classroom has only improved since they began teaching and that every participant ranked themselves at least average in their skills of using instructional technologies in the classroom with 40% of them ranking above or far above average. I believe these varying correlations are linked to the relatively small pool of participants who responded to the survey and that they did so due to their confidence with technology.

I noticed a contradiction that participants provided very little variety in their examples when asked what types of instructional technology they used in the free response section of the survey. Most of the participants' examples included the use of Google applications such as Docs and Classroom, only one example varied, using Kahoot as an example, and the remaining free responses did not provide examples at all. In comparison to the vast amounts of adaptive technologies, web-based software, and other instructional technologies discussed in the prior research by Barbetta and Spears-Bunton (2007), Naraian and Surabian (2014), and Smith and Tyler (2011), these examples were severely lacking and were barely used for differentiation regarding students with IEPs or 504 plans. The only example mentioning differentiation was from Participant 9, stating that "Google forms catered to/scaffolded towards students with IEPs [and] Google docs shared specifically to students requiring copy of notes per IEP accommodations."

### **Opinions of Gathered Data**

One of my biggest concerns from conducting this research is what teachers consider proper differentiation in using instructional technology. As Fazelian (2011), Naraian and Surabian (2014), and Smith and Tyler (2011) suggest in their research, many educators use technology as a simple substitute to replace physical assignments as opposed to a tool to enhance the learning of their students through alternate pedagogical methods. The responses of using Google applications as their main source of instructional technology leads me to believe my participants mostly use technology as those substitutes without gauging other options for the purpose of differentiation for their students with disabilities or other needs. For example, Participant 11 states, “I love the Google applications: forms, email, drive, calendar, --my students and I are connected in every way EXCEPT classroom--I do not like Google Classroom. I would appreciate more in-depth trainings around Google or similar applications.” The student connection that they mention is an important factor for catering to student needs, but there is no evidence of how this helps with their differentiation tactics to modify the technology use for individual students.

I also noticed that some respondents contradict themselves within the survey which makes me question the validity of some of the data. For example, Participant 3, who states that they only use instructional technologies “occasionally, but not every week,” also states that they use instructional technologies as a differentiation tool for students with an IEP or 504 plan “very often” to the point of “every day.” Additionally, Participant 9 states that their students only use instructional technologies “about twice a week,” however they state that they use instructional technology as a differentiation tool “very often.” These contradictions make me believe that



there is confusion among teachers about what qualifies as instructional technology and how to properly incorporate it into their lesson and differentiation planning.

### **Suggestions for Future Research**

Technology advances quickly and so it is difficult for the research to keep up. I was hesitant to use some examples from prior research simply because the article was several years old and much of the technology has either been improved or become obsolete. Future research needs to follow the way of its subject matter and, regarding instructional technologies, research cannot seem to keep up. Research should steer away from specific pieces of technology and become more focused on methodologies of how teachers can properly integrate technologies into their tools for differentiation in a more general sense. A local teacher agrees in an interview, stating that technology will usually only have an optimal lifespan of about three to five years and that oftentimes school budgets do not allow for the constant upgrades. This will give teachers a solid foundation for technological understanding and comprehension so that they may learn specific technologies more easily on their own or with colleagues and not have to always rely on professional training every time a technology is released or updated. In an interview with the Head of Technology at a local high school, he states that his main role is to be an “instructional coach to teachers” so that they may learn about technologies and how they work so that the teachers may adapt the technologies in a more pedagogical mindset rather than relying on the technology department to choose technologies for them. He also claims that this is abnormal because many districts only have one to a handful of technology professionals for the entire district, whereas his district has one available at each school to provide a more accessible experience for both teachers and students.

In addressing my research question: In what ways do teachers use instructional technologies to enhance differentiation methods and student-teacher interactions in an inclusive secondary English classroom and how can those methods be improved? According to the responses of the survey, most teachers tend to use more software, like Google applications or Kahoot, than assistive technology hardware, like alternative writing technologies, relying on what is already installed on their computers over what they can bring in from special education classrooms or other sources. Though these software applications can improve student-teacher connectivity through an online format, they generally fail at providing students with disabilities the specific needs they have regarding differentiation. This tendency can be improved through more cooperation and collaboration with colleagues in other general education, inclusion, and special education classrooms so that teachers can combine their knowledge and experience with different technologies to optimize what works best for their students with disabilities. This can be measured by using a longitudinal data study to analyze how student grades change over the course of a year by introducing instructional technologies into their differentiation plans before and after teachers collaborate with one another.

With my other research question: What are the beliefs and attitudes that English teachers have towards the use of adaptive and other instructional technologies? Teachers generally responded positively to the idea of using these technologies in their inclusive classrooms which shows an overall enthusiasm for learning more about instructional technologies and how to incorporate them into their curriculum. However, this is hindered by the lack of variation of technologies that teachers responded with using in their classrooms. This variation can be improved with more professional training and attention to what instructional technologies are available at a school and how to use them in a pedagogical sense. The needs of teachers and the

improvement of professional training can be gauge by performing a case study centered around how well teachers respond to technological training and then focusing on what ways to alter that training to be more accessible to teachers.

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## Appendix A

**ADULT RESEARCH PARTICIPANT INFORMED CONSENT FORM****Brief Description**

The purpose of this research is to investigate two questions: Firstly, in what ways do teachers use instructional technologies to enhance differentiation methods and student-teacher interactions in an inclusive secondary English classroom? Additionally, what are the beliefs and attitudes that English teachers have towards the use of adaptive and other instructional technologies?

Participants who volunteer for this study will respond to an anonymous survey that will take about 30 to 60 minutes to complete. The risks to participants in this study are very minimal and there are no direct benefits or rewards for participants in this study.

**Please read the remainder of this form before deciding if you want to volunteer to be in this research study.**

My name is Zachary Caldwell, I am a graduate student at the University of Mary Washington, and I am seeking your consent to participate in this research study. Involvement in the study is voluntary, so you may choose to participate or not. The information below explains the study in detail. Before volunteering, please ask any questions that you may have about the research; I will be happy to explain anything in greater detail. My contact information is listed below.

**Details of Participant Involvement**

Participants must meet three requirements to be eligible for this study. Firstly, they must be a licensed teacher practicing in public schools in the United States. Secondly, they must be an active/practicing English teacher at the middle or high school level. Lastly, at least one of their classes must be considered an inclusion class. Knowledge and experience of instructional technologies are not required for taking the survey. Questions on this survey inquire about participants' knowledge, experience, and opinions through multiple-choice, Likert scale, and free response style questions.

**Privacy and Confidentiality**

All information about participants will be anonymous. This means that neither I nor anyone else will know who participated in the survey or be able to associate participants' survey responses to their names. No questions on the survey will ask for any identifying information about participants or schools. The data will be stored through Survey Monkey (see their privacy policy [here](#)). For back-up and analysis purposes, I will also keep survey data on my personal password-protected computer. When the research and report of this study are completed, the survey and all corresponding data about participants will be removed from the internet as well as from any backup and data analysis files.

**Risks and Benefits of Participation**

The only foreseeable risks to participants in this study are minimal. One possible risk is discomfort in answering questions about personal opinions. To minimize this risk, you do not have to answer any questions you do not want to answer. Another possible risk is that from details in your survey answers, you may indirectly or accidentally reveal your identity. To minimize this risk, any parts of responses from a participant that include identifying personal information will be deleted from the data, and in any reports of this research, individual survey responses will be edited or paraphrased to prevent any possible participant identification. If you should experience any difficulties during the study, please tell me immediately so that I may take appropriate action. The benefit of this research is that it will contribute to better understanding of current implementations and opinions of instructional technologies being used as tools for differentiation by secondary English teachers with inclusive classrooms. Additionally, this research will help find more consistent ways to improve the uses of instructional technologies as a differentiation tool in an inclusive English classroom. There are no direct benefits to you as a participant.

**Participant Rights**

You have the right to **ask any questions you have** before, during or after participation, and I encourage you to do so. If you do not want to be in this study, there will be no penalties or loss of benefits that you are entitled to. As a voluntary participant in this research, you have the right to refuse to perform any activities and answer any questions that I ask of you. You have the right to leave the study at any time by closing the survey website. If you decide to leave the study, any data collected from you will be deleted from the records and unused in the study. This research has been approved by the University of Mary Washington Institutional Review Board, a committee responsible for ensuring that the safety and rights of research participants are protected. For information about your rights as a research participant, contact the IRB chair, Dr. Tyler (jtyler@umw.edu).

**Contact Information**

For more information about this research before, during or after your participation, please contact me (zcaldwel@mail.umw.edu) or my university supervisor, Dr. Reynolds (preynold@umw.edu). To report any unanticipated problems relating to the research that you experience during or following your participation, contact me or my university supervisor, Dr. Reynolds (preynold@umw.edu).

***Before agreeing to this form, please ask me any questions you have about participation in this study.***

## Appendix B

**Introduction Page:**

**[This will be the first page that participants see after agreeing to the consent form. It will provide instruction on how to complete the survey]**

Thank you for agreeing to participate in this survey!

Please remember that you are not obligated to answer any questions that you do not want to answer and that you may exit the survey at any time by closing your web browser if you no longer wish to participate.

Here are some brief instructions on navigating the survey:

This survey is separated into four pages of questions: General Information, Instructional Technology, Needs of Improvement, and Free Response. When you complete the questions on a page, click the “Next” button at the bottom of the page to continue onto the next set of questions. You may also select the “Back” button if you wish to revisit previous pages.

There are three types of questions on this survey: Multiple choice, Likert scale, and free response.

For multiple choice questions, click on the answer that you agree with or that applies to you the most. Some of these questions may have an “Other” option followed by a comment box. If you choose other, you can click on the comment box to type your own response.

For Likert scale questions, you will be presented with several opinions and asked how you feel about them. There is a 5-point scale from “Strongly Disagree” to “Strongly Agree” or “Not Interested” to “Very Interested” that you will choose from.

For free response questions, there will be a text box following each question. Click on the text box and type out your response.

If you have any further questions about this study or how to complete the survey, please feel free to contact me ([zcaldwel@mail.umw.edu](mailto:zcaldwel@mail.umw.edu)). You may also go to Survey Monkey’s Help Center for additional assistance taking this survey by clicking [here](#).

Thank you again for participating in this study and I look forward to seeing the results!



**Survey Questions:****General Information [First page of survey questions]**

*These questions will ask about you and your teaching experience.*

In what age range do you fall under?

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65+

How many years have you been teaching?

- First year teacher
- 1-5 years
- 6-10 years
- 11 years or more

What is the highest level of degree that you currently hold?

- Bachelor's
- Master's
- Doctorate or Ph.D.
- Other (please specify)

**[Comment box for "Other" option]**

At which level are you currently teaching?

- Middle school
- High school
- Both middle and high school

How many inclusion classes do you currently teach?

- 1
- 2
- 3
- 4 or more

Instructional Technology [Second page of survey questions]

*These questions will ask about your experience, history, and opinions about using instructional technologies in your inclusive classrooms.*

How would you rate your overall skill in using technology in the classroom?

- Far below average
- Below average
- Average
- Above average
- Far above average

On average, how many times a week do YOU use instructional technologies in your lessons?

[Ex. SMARTBoard, PowerPoint]

- Never
- Occasionally, but not every week
- About once a week
- About twice a week
- About three times a week
- More than three times a week

On average, how many times a week do STUDENTS use instructional technologies in your lessons? [Ex. Text-to-speech software, WebQuests]

- Never
- Occasionally, but not every week
- About once a week
- About twice a week
- About three times a week
- More than three times a week

How often do you use instructional technologies as a differentiation tool for students with an IEP or a 504 plan?

- Never
- Rarely
- Sometimes
- Often
- Very often

As an English teacher, I feel that incorporating technology into my lessons is...

- Less difficult than other disciplines
- About the same difficulty as other disciplines
- More difficult than other disciplines

Please rate your current opinion on using instructional technologies compared to when you first began teaching.

- Much more negative
- Somewhat more negative
- Remained the same
- Somewhat more positive
- Much more positive

When using instructional technologies during lessons...

|   | Strongly disagree | Disagree | Neither disagree or agree | Agree | Strongly agree |
|---|-------------------|----------|---------------------------|-------|----------------|
| Students show a higher level of learning  |                   |          |                           |       |                |
| Student motivation is higher  |                   |          |                           |       |                |
| Students with IEPs or 504 plans keep a similar work pace with other students during lessons   |                   |          |                           |       |                |
| Students are distracted by the technology   |                   |          |                           |       |                |
| There is a clear set of expectations as to how students should use these technologies in support of learning the core academic curriculum |                   |          |                           |       |                |

Regarding professional development in the subject of technology...

|   | Strongly disagree | Disagree | Neither disagree or agree | Agree | Strongly agree |
|---|-------------------|----------|---------------------------|-------|----------------|
| I feel that I have adequate professional development around developing the pedagogies necessary to create and support a student-centered learning environment |                   |          |                           |       |                |
| Technology advances too rapidly and outpaces relevant training  |                   |          |                           |       |                |
| I have used instructional technologies more often because of receiving professional development   |                   |          |                           |       |                |

Needs of improvement [Third page of survey questions]

*These questions are to gauge what teachers need to become more successful in terms of using instructional technologies.*

I feel a need for...

|   | Not interested | Slightly interested | Neutral | Interested | Very interested |
|---|----------------|---------------------|---------|------------|-----------------|
| More time to learn the intricacies of specific technologies                               |                |                     |         |            |                 |
| More time to plan using technology as a differentiation tool in lessons                   |                |                     |         |            |                 |
| More professional training incorporating technology                                       |                |                     |         |            |                 |
| More support from administration staff when it comes to using technology in the classroom |                |                     |         |            |                 |
| Better technical support when a technology malfunctions                                   |                |                     |         |            |                 |
| Better access to software and hardware in school  |                |                     |         |            |                 |
| A faster, more reliable internet connection at school                                     |                |                     |         |            |                 |
| More collaboration  |                |                     |         |            |                 |

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| with<br>colleagues on<br>the use of<br>technology in<br>the classroom |  |  |  |  |  |
|---|--|--|--|--|--|